

THE SECONDARY USE AND REDUCTION OF CYLINDRO-CONICAL STONE ARTIFACTS FROM THE NORTHERN TERRITORY

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ABSTRACT

Although cylindro-conical stones (cylcons) are varied in form and occur over a wide geographic area in Australia, their function has consistently been assigned to ritual purposes. This has also been the case with those found in the Northern Territory. This paper proposes that the life histories of some of the forms present in the collections of the Northern Territory Museum suggest complex functional switches between eultural sub-systems. This involves the cylcons' change from an initial use in ritual to a later incorporation in the preparation technology. This hypothesis has the advantage of being more testable archaeologically than those previously forwarded and better able to explain the use wear patterns and reduction sequence proposed for the cylcon sample.

KEYWORDS: Cylindro-conical stones, cylcons, secondary use, lithic reduction sequences, functional change, Northern Territory, Australia.

THE ARTEFACTS

Cylindro-conical stones or cylcons have been described from Eastern, Central and Northern Australia (Black 1942; Kamminga and Allen 1973:11; McCarthy 1976:66, McCourt 1975:149-152). McCarthy (1976:68) has suggested that eylcons had ritual significance and that the damage seen on some forms is associated with ritual destruction. While this may have been the case in other areas, the evidence suggests that the stone artifacts which may be classified as cylcons, found in the region between the Adelaide and Alligator Rivers east of Darwin N.T., exhibit a more complex life history involving secondary use and reduction. The presence of extensive and varied use wear on the artifacts, combined with observations of their use by contemporary Aboriginal groups, indicates that these forms are connected in a more complex manner. The aim of this paper is to examine this relationship and suggests an alternative to the assumption that ritual behaviour explains the morphological variation.

The cylcon forms found in the Adelaide-Alligator Rivers region (see Fig. 1) conform to McCarthy's (1976:66) general description of the type: 'cylindrical in shape

tapering to a pointed or rounded distal end'. The primary form from the area first described by McCarthy (1951) is lenticular in long section (i.e. bipointed) and circular in cross section. Generally made from silicified sandstones, quartzites and granites, they appear to be fashioned from a natural blank, shaped by percussion flaking and finished by hammer dressing to a high standard (Fig. 2). It will be referred to as the primary form in this work.

Besides this form, five previously undescribed forms are also found in the area. These will be referred to as forms 1-5 respectively and are described as follows:

1. Similar to the primary form with extensive battering and flaking on one end (Figs 3,4).
2. Blunted longitudinal section and circular cross-section with battering and flaking from both ends. Most of these are made on metamorphic rocks (Fig. 5).
3. A sub-triangular longitudinal section with a rounded base and oval cross-section (Fig. 6).
4. Similar to form 3 but smaller with a circular cross-section and battering and flaking on both ends (Fig. 7).
5. A form distinguished by its irregular

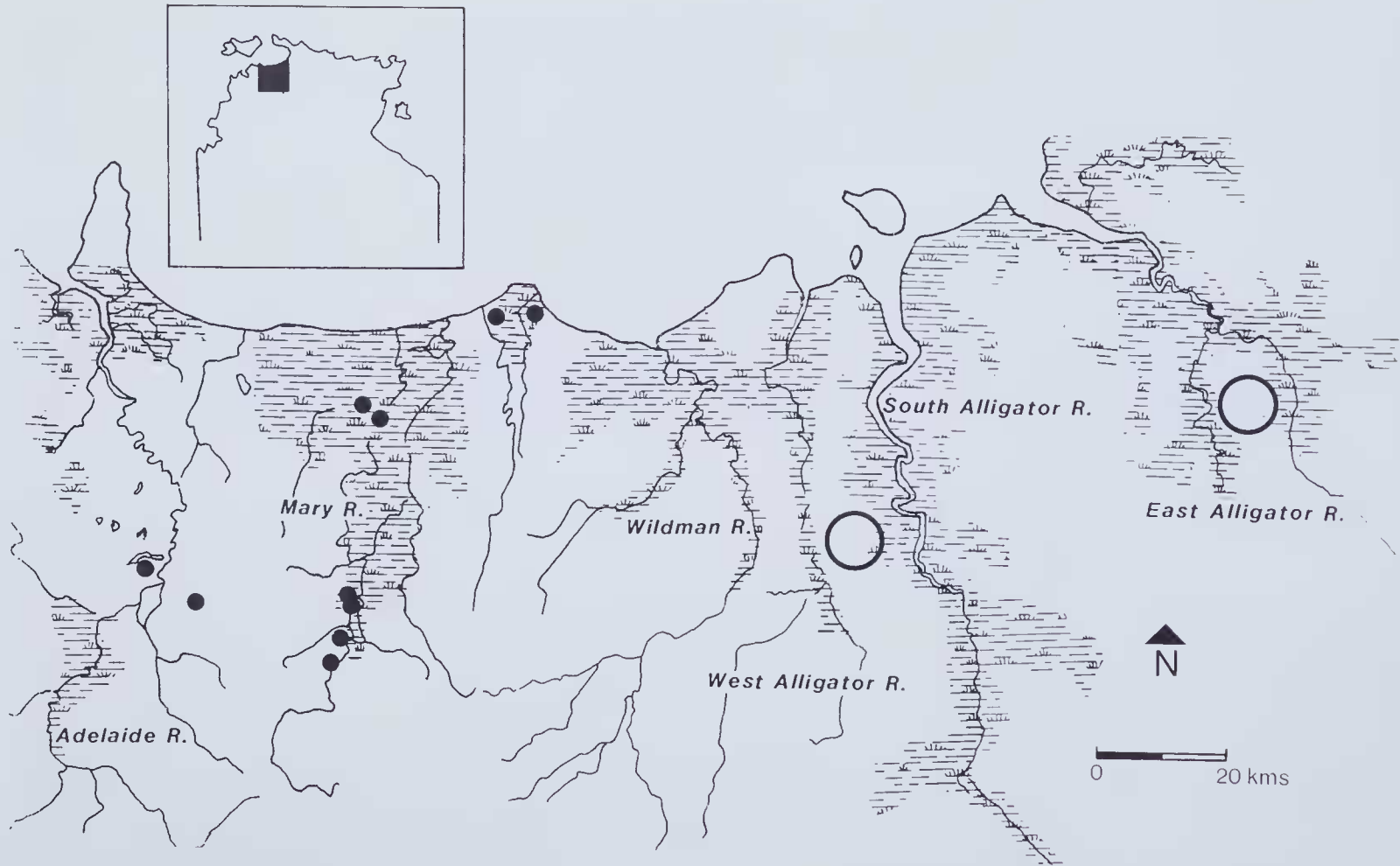


Fig. 1. The recorded distribution of cylcons with use-wear (● individual sites; ○ general locations).

cross-section, elongated shape and the presence of extensive flaking on the body. Some examples also have a hammer dressed point at one end (Fig. 8).

Using McCarthy's (1976) definitions, these forms could all be viewed as separate sub-types whose morphology could be explained only by reference to differences in the requirements of an unrecoverable ritual system. As already

indicated, a number of lines of evidence show this to be too limited an approach.

USE WEAR

The use wear on the cylcons examined in this study is consistent with them being used for pounding and crushing functions. The wear may be divided into three types: battering, flaking and surface smoothing. As no microscopic examination of the wear

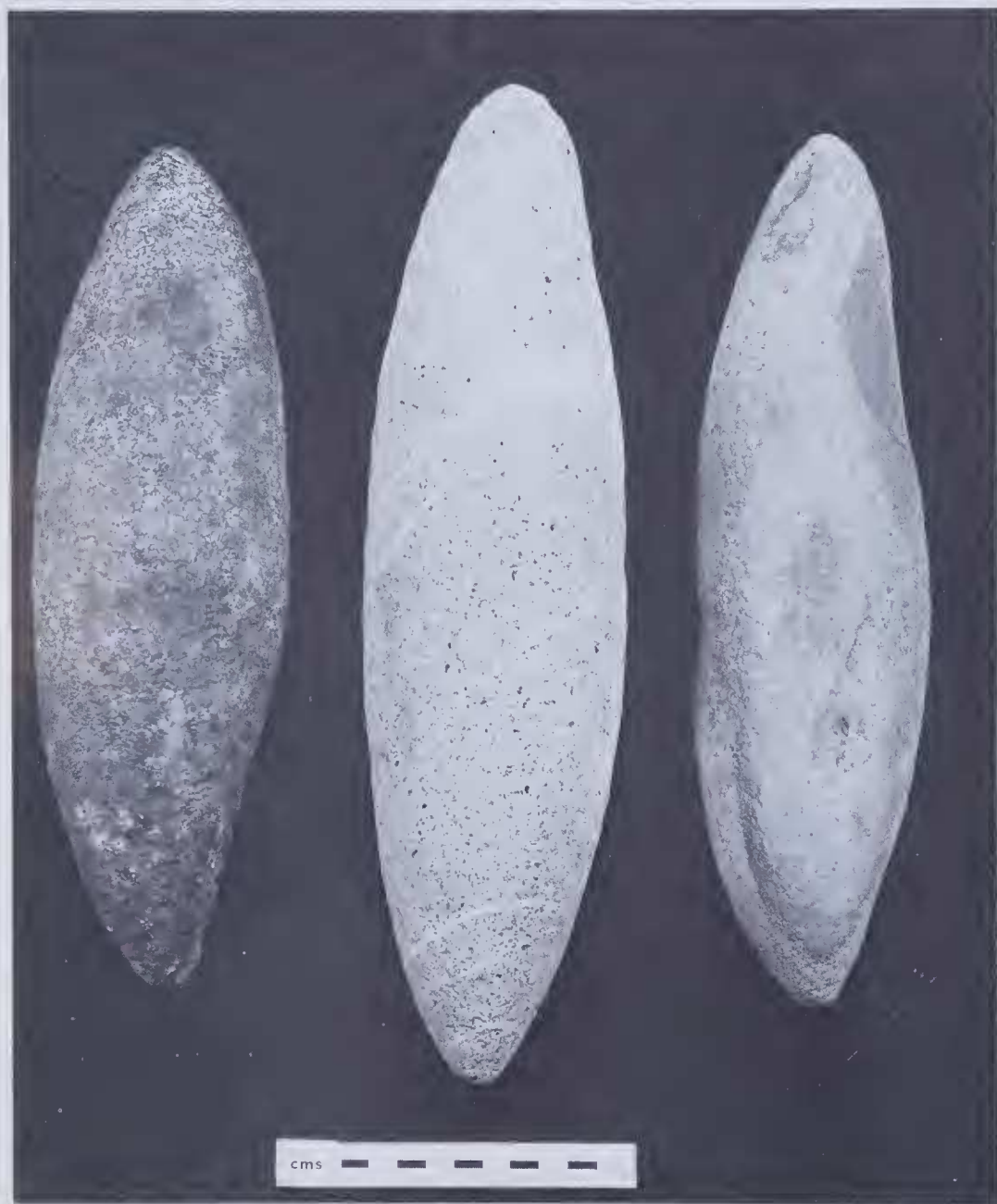


Fig. 2. Primary form.



Fig. 3. Form one.

patterns was carried out, these terms refer to normally visible wear features only. Flaking as shown on the artifacts illustrated is generally confined to the margins of the contact surface. In some artifacts, however, the contact surface has been substantially removed along with large sections of the body of the implement. In these cases it is probably more accurate to attribute such damage as breakage as a result of high bending loads applied to an end.

In all forms the battering (Fig. 9) occurred on the ends, with smoothing only along the body of the artifact. It is

unlikely that any smoothing on the ends would survive the used mode which produced the flaking and battering. The term 'smoothing' is used here to cover a wear pattern that grades from a surface smoothing to a high gloss (Fig. 10). There are few examples showing a high gloss which is confined to the high points of otherwise rough surfaces. The problems of defining smoothing, polishing and glossing as wear patterns and the process of their production are discussed in Hayden (1979).

Table 1 records the number and percentage occurrence of wear type by form. The small size of some of the samples

makes it difficult to be certain about wear patterning, although both the primary form and the form 5's showed relatively less battering and flaking wear than other forms. These two samples also contained the only artifacts to exhibit no evidence of use wear. Smoothing was generally less common than flaking and battering, and was lowest in the form 3 and form 4 samples followed by the primary and form 5 samples. In general the form 1 and 2 samples showed the highest occurrence of all wear types.

Table 1. Wear Type by Cylcon Form.

	No.	Battering	Flaking	Smoothing	No wear
Primary	7	3 (43%)	1 (14%)	2 (28%)	2 (28%)
Form 1	15	2 (73%)	15 (100%)	6 (40%)	-
Form 2	10	9 (90%)	8 (80%)	7 (70%)	-
Form 3	6	6 (100%)	3 (50%)	1 (17%)	-
Form 4	5	3 (60%)	2 (40%)	1 (20%)	-
Form 5	17	6 (35%)	4 (24%)	6 (35%)	6 (35%)

The formal similarities between the forms, combined with the patterns of use



Fig. 4. Form one at a more advanced stage of reduction.



Fig. 5. Form two.

wear, suggested that all six forms could be the products of a single reduction sequence. The sequence incorporating both manufacturing and use reduction stages, begins with the form 5's as preforms, the primary forms as the finished product and the forms 1, 2, 3 and 4 as various stages of use reduction. The form 4's represent the broken tips of primary forms.

Three hypotheses of sequence were used to test the reduction sequence. The results showed that the forms 2 and 3 could not be considered part of the above reduction sequence; the form 2's having too small a circumference to length ratio and the form 3's showing high mass relative to the ex-

pected mass loss predicted by a volumes of revolution model.

A single broken specimen made from metamorphic rock with a small rounded tip suggests that a form similar to the primary form may mark the initial form of the form 2's. Larger samples are necessary before this can be adequately tested, however.

Although the primary form and forms 2 and 4 satisfied the conditions of the hypotheses of sequence, the form 5's position as a preform was not supported. Despite these ambivalent results there is, on morphological characteristics alone, a good argument for the existence of a

sequence incorporating the form 5, primary form, form 1 and form 4.

FUNCTIONAL CHANGE

The observation that present day Aborigines use stones for pounding and grinding, and use the archaeological forms examined here for such tasks, indicates that much of the use wear observed on these forms can be attributed to recent food production rather than ritual behaviour. The cylcons are not made but collected like any other suitable stone (Smith, pers. comm).

The simplest argument which could therefore be forwarded to account for the cylcons in this study is that they are simply highly crafted pestles which are

not manufactured today because there is little demand for them. There are, however, a number of lines of evidence which run counter to this suggestion.

Firstly, there is no detailed record of implements like these being used for the preparation of materials in the ethnographic literature. Peterson (1968) has recorded the use of mortars and pestles on Elcho Island some 400 kms east of the area where the cylcons occur. 'The pestle is often a smooth, round, water-rolled pebble though it may be any fairly symmetrical stone that fits the hand' (Peterson, 1968:567). The mortars are simply rocks with a 'fairly level top and bottom which will not split on being hit' (Peterson 1968:567).



Fig. 6. Form three.



Fig. 7. Form four.

The women use the mortars and pestles for the preparation of vegetable staples like cycad nuts (*Cycas media*), yams (*Discorea sativa* var. *elongatus* and *rotunda*), water lily roots and seeds (*Nymphaea gigantea*) and fruits (*Buchanania obovata* and *Persoonia falcata*). Both grinding and pounding is used in the processing of these foods. The mortar and pestle were also used for the extraction of marrow from bone and for the preparation of iron wood (*Erythrophleum chlorostachys*) resin.

Warner's (1958:497) description of mortars and pestles from Eastern Arnhem Land corresponds with Peterson's and states that, although the pestle is 'usually egg-shaped' it is a naturally occurring pebble. McCarthy and Setzler (1960:247-8) also describe similar artifacts from Milingimbi.

The only record of stone pestles being used in the Northern Territory comes from Levitt's (1981:49) observations on Groote Eylandt, where the pestles were "...made from heavy pieces of sandstone and were narrow at one end with a heavy, broad flat base at the other". With a

weight of 4-5kgs these implements were markedly heavier than those described by McCarthy and Setzler (1960:247-8) and those measured in this analysis. Tindale (1925-26) makes no mention of such regular implements in his earlier report.

Baker's (1981:66) suggestion that the cylcons may have functioned in conjunction with the numerous pounding hollows found in the Adelaide-Alligator Rivers area, in a conventional mortar and pestle arrangement was not confirmed in the field. Baker found that they showed no positive correlation with any site type and were not found in association with the pounding hollows, which occurred in the pandanus fringe sites. This is confirmed by both Dupe's and Smith's (pers. comm.) observations.

The cylcons are not the only implements in the Adelaide-Alligator Rivers region to show use wear patterns consistent with pounding and grinding. Use polished and battered pebbles occurring in the area are consistent with the description of the technology used further east. They indicate that, as in the east, naturally occurring stones probably served as the basic implements in

the preparation technology. There is also no evidence to support the need for highly crafted pestles for any of the observed food processing behaviour.

As the primary form, for example, represents one of the highest labour costs of manufacture for any stone artifact found in Australia, it seems incongruous that such an artifact would be manufactured to function simply as a pounding and grinding implement, when naturally occurring stones can be used to perform the same task. The bipointed shape of the primary form seems unsuitable for anything but the most specialised pounding activities, where the high force per unit area at the point would be useful in

breaking up material into large sections. There is no recorded process for which such a system would need to be specifically designed. There is also no evidence that any attempt was made to curate the point on the primary forms once they were reduced.

The hypothesis forwarded to cover this incongruity is that the primary form, form 2 and form 3 functioned initially in the socio-ideological subsystem of the culture and only later in their use life did they function as a part of the preparation technology being reduced and discarded accordingly.

Stone artifacts have been incorporated into the socio-ideological subsystem of



Fig. 8. Form five.



Fig. 9. Battering wear on the end of a form two.

northern Aboriginal groups. McCarthy (1951:349) in describing a cyclon from the Adelaide River states that the donor, Captain Murphy was told by the local Aborigines that it was made 'a long time ago'. McCarthy (1951:349) also reports that: "W. E. Harney was told by one of the old men from the area that he had seen such stones in use — they were buried until required for certain ceremonies during which they were rubbed on a girl reaching puberty to ensure here fertility". This explanation is in conflict with Harney's (1959:162-3) later account of their use as sorcery objects. McCarthy (1976:69) also cites this latter explanation. These varying accounts may reflect Aboriginal confusion about the cyclons' original function or an unwillingness to describe their true function. Warner

(1958:501-502) describes stone totemic 'emblems' (*ranga*) from eastern Arnhem Land occurring in pointed and flat oblong forms. 'The former is usually a river-bed stone of the form and shape of an upper grinding stone' (Warner, 1958:502). Further east, Flinders (1814:11,172) also records similar objects to those examined here from the Sir Edward Pellew Islands.

In Western Arnhem Land totemic emblems of stone were also used. Berndt and Berndt (1964:370) claim that they represented eggs or yams. Two totemic artifacts have been recorded with similar shapes to those of the primary form and form 3 in Mountford (1956: Pl. 149 e,f). A similar wooden form made by England Bangala from the Cadell River, representing lily roots wrapped in paper-bark is illustrated (Fig. 11). Spencer

(1914: Pl. V, VII) also illustrates sacred stone artifacts from the Kakadu region.

There is no detailed information on the fate of sacred objects once their ceremonial function was complete. According to Berndt and Berndt (1964:233), they were either stored for future ceremonies or destroyed, according to the tradition of each totem. Warner (1958:350) states that *ranga* were often 'given-away' although there was 'a feeling against it'. Spencer (1914:226) points out that wooden objects could not be preserved over long periods of time and would have to be regularly re-made. Mechanisms therefore existed which compensated for the removal or loss of objects from the socio-ideological sub-system.

The cylcons' switch from initially functioning in the socio-ideological, to then functioning in the technological subsystem, may have resulted in a number of ways. One possibility is that the transference of forms from one subsystem to another was maintained as a method of

disposing of sacred stone objects. This would have the advantage of freeing potentially usable stone resources for use in the technological subsystem, in an area where such resources were not readily accessible (for example the flood plains of the Adelaide and Mary Rivers). There is, however, no recorded precedence for such a system.

A second possibility is that cylcons represent not the final user's solution to disposal, but that of a neighbour. Warner (1958:341,350) implies that sacred objects, and those associated with them, were often incorporated into an exchange system once the appropriate ceremonies were over. The cylcons' systems switch could therefore be the product of exchange of this sort. This would have the advantage of removing objects from the context in which they were sacred, into another, non-sacred context, affording an economic benefit to both giver and receiver. McCarthy (1951:349) forwards a similar argument for a cylcon exhibiting battering from Eastern New South Wales.



Fig. 10. High gloss wear on the body of a form one.

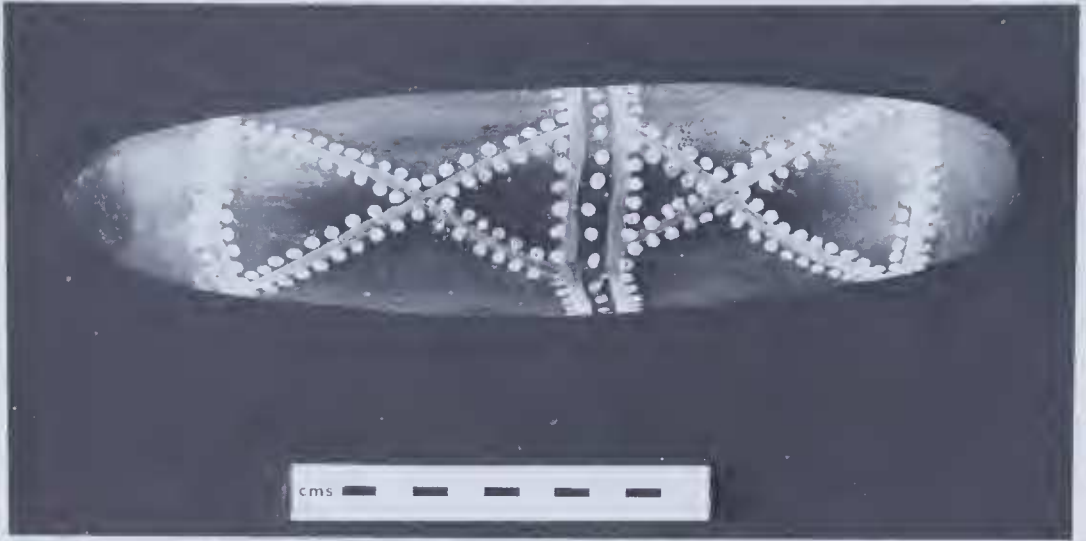


Fig. 11. A representation in wood of lily roots wrapped in paper bark from Cadell River, Western Arnhem Land. Artist - England Bangala.

A third interpretation is that the functional shift occurred through local cultural change. In this case, diachronic change in the socio-ideological subsystem would have made previously captured stone resources available at a later time for utilization in the preparation technology.

A number of further hypotheses incorporating change through both time and space and containing all three of the above hypotheses in varying combinations are also possible. The first hypothesis predicts that there would be no spatial or chronological variation in the proportions of primary to reduced forms through time and space. The second, that there would be an increase in the proportion of primary to reduced forms towards the edges of the cylicon distribution (assuming a simple exchange system), which will be uniform through time. Finally, the third predicts that there would be a decrease in primary forms through time.

Although these hypotheses are potentially testable archaeologically, there may be some difficulties associated with the identification of cylicons which have entered the archaeological record while still in a ritual context. While use wear, it is argued, is evidence of a cylicon's removal from the socio-ideological subsystem, the lack of wear on primary forms does not necessarily indicate that they were functioning in that sub-system at the

time of deposition. Objects like the primary form cylicons, while being used in such contexts, are likely to have been stored on sites specifically associated with their original function. Such storage is, however, unlikely to have a high archaeological visibility. The degree to which these problems would figure in archaeological investigations depends on the chronological and spatial complexity of the cylicons' history.

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